

We claim:

1           1. A computer implemented method of controlling the broadcast and reception of  
2 interactive application, comprising:

3           receiving control signals that control the broadcast of broadcast programs;  
4           determining from the controls signals an interactive application associated with one of  
5           the broadcast programs; and  
6           generating from the control signals, commands to maintain execution and termination  
7           of the interactive application in synchrony with either the display or the  
8           broadcast of the broadcast program.

1           2. The method of claim 1, wherein generating the commands further comprises:  
2           generating commands to maintain synchronous display of the interactive application  
3           with display of the broadcast program on a broadcast receiver.

1           3. The method of claim 1, wherein generating the commands further comprises:  
2           generating commands to terminate display of the interactive application in synchrony  
3           with termination the display of the broadcast program.

1           4. The method of claim 1, generating the commands further comprises:  
2           determining from the control signals a state of the broadcast program;  
3           responsive to the state of the broadcast program, determining a state of the interactive  
4           application; and  
5           generating at least one command appropriate to the state of the interactive application.

1           5. The method of claim 1, wherein the broadcast program is a television show, and  
2 wherein generating the commands further comprises:

3           determining from the control signals that a commercial is being broadcast;  
4           responsive to determining that a commercial is being broadcast, generating a  
5           command to suspend execution of the interactive application associated with  
6           the television show; and

responsive to determining that the commercial is no longer being broadcast,  
generating a command to resume execution of the interactive application  
associated with the television program.

6. The method of claim 1, wherein the broadcast program is a first television show, and  
wherein generating the commands further comprises:

determining from the control signals that a commercial is being broadcast;  
receiving a control signal to terminate the television show;  
responsive to determining that a commercial is being broadcast, generating a  
command to suspend execution of the interactive application associated with  
the first television show; and  
responsive to determining that the first television show is being broadcast after the  
commercial, generating a command to restart execution of the interactive  
application associated with the first television show.

7. The method of claim 1, wherein the broadcast program is a first television show, and  
wherein generating the commands further comprises:

determining from the control signals that a commercial is being broadcast;  
receiving a control signal to terminate the television show;  
responsive to determining that a commercial is being broadcast, generating a  
command to suspend execution of a first interactive application associated  
with the first television show; and  
responsive to determining that the first television show is being broadcast after all the  
commercials in the commercial break, generating a command to restart  
execution of the first interactive application; and  
responsive to determining that a second television show is being broadcast,  
generating commands to terminate the first interactive application and to  
begin execution of a second interactive application associated with the second  
television show.

1 8. The method of claim 1, wherein receiving control signals comprises comprises  
2 receiving the control signals from a scheduling system by emulating a broadcast source device  
3 that is controlled by the scheduling system.

1 9. The method of claim 1, wherein each control signal is associated with a broadcast  
2 program, and wherein receiving control signals comprises:

3 translating the controls signals into a set of commands to an interactive application  
4 server for selectively instructing the server to schedule, start, stop, and cancel  
5 interactive applications for the broadcast programs associated with the control  
6 signals.

1 10. The method of claim 1, wherein the controls signals are generated by a scheduling  
2 system in response to a playlist defining a series of broadcast programs including program  
3 identifiers and information describing when the broadcast programs are to be broadcast.

1 11. The method of claim 1, wherein the controls signals are generated by a scheduling  
2 system in response to actions of an operator to manually control broadcast of a broadcast  
3 program.

1 12. The method of claim 1, wherein the controls signals are pre-recorded and stored in  
2 association with the broadcast programs that are controlled by the control signals.

1 13. The method of claim 1, further comprising:

2 receiving a prepare control signal to prepare the broadcast of a selected broadcast  
3 program;

4 determining an interactive application associated with the selected broadcast program;  
5 generating a command to schedule execution the determined interactive application.

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- 1 14. The method of claim 1, further comprising:  
2 receiving a start control signal to prepare the broadcast of a selected broadcast  
3 program;  
4 determining an interactive application associated with the selected broadcast program;  
5 generating a command to start transmission of the determined interactive application.
  
- 1 15. The method of claim 1, further comprising:  
2 receiving a start control signal to prepare the broadcast of a selected broadcast  
3 program;  
4 determining an interactive application associated with the selected broadcast program;  
5 generating a command to start execution the determined interactive application by  
6 transmitting a trigger to an interactive application previously transmitted.
  
- 1 16. The method of claim 1, further comprising:  
2 receiving a control signal to stop the broadcast of a selected broadcast program;  
3 determining an interactive application associated with the selected broadcast program;  
4 generating a command to cancel execution the determined interactive application.
  
- 1 17. The method of claim 1, further comprising:  
2 determining a type of broadcast program for a control signal.
  
- 1 18. The method of claim 17, further comprising:  
2 determining a type for an interactive application as a function of the type of the  
3 broadcast program.
  
- 1 19. The method of claim 1, further comprising:  
2 determining a type of broadcast program for a control signal to be either a television  
3 show, a commercial, or unknown; and  
4 determining a type of interactive application appropriate to the type of the broadcast  
5 program.

1           20. The method of claim 1, wherein the scheduling system provides controls signals to  
2 prepare, start, and stop a broadcast source, and further comprising:

3           in response to receiving a prepare signal for a broadcast program, generating a  
4           command to schedule an interactive application associated with the broadcast  
5           program, and generating a command to start the interactive application  
6           associated with the broadcast program;

7           ignoring a received start signal for the broadcast program where the command to start  
8           the interactive application associated with the broadcast program has already  
9           been generated; and

10          in response to receiving a stop signal for the broadcast program, generating a stop  
11          command to stop the interactive application associated with the broadcast  
12          program.

13           21. The method of claim 1, wherein the scheduling system provides controls signals  
14          which selectively distinguish television shows and commercials by the presence or absence of  
15          the identification codes in the controls signals, and further comprising:

16          in response to receiving a control signal containing an identification code indicating  
17          the broadcast of a commercial during a television show, generating a  
18          command to schedule an interactive application associated with the  
19          commercial, generating a command to start the interactive application, and  
20          determining if an interactive application for the television program is  
21          executing and generating a command to stop the execution of the interactive  
22          application for the television show; and

23          in response to receiving control signal not containing an identification code for a  
24          commercial, generating a command to cancel the interactive application  
25          associated with the commercial, and generating a command to start the  
26          interactive application.

1           22. The method of claim 1, wherein the scheduling system provides control signal  
2 including data identifying each broadcast program and its duration, and further comprising:

3           generating commands to selectively schedule, start, stop, and cancel interactive  
4           applications associated with the broadcast programs using the identification  
5           data and the duration data from the control signals.

1           23. The method of claim 1, further comprising:

2           maintaining for each broadcast program which is associated with an interactive  
3           application a first state machine that responds to the controls signals to  
4           transition through states associated with the broadcast program, and that  
5           generates commands in selected states related to desired behavior for the  
6           interactive application for the state of the broadcast program; and

7           maintaining for the interactive application associated with the broadcast program a  
8           state machine that responds to the commands from the broadcast program's  
9           state machine to that transitions through states associated with the interactive  
10          application, and which selectively generates the commands to maintain the  
11          synchronous execution of the interactive application with the broadcast  
12          program.

1           24. A method of controlling execution of interactive applications for televisions shows  
2 and commercials, comprising:

3           generating commands to cause execution of an interactive application associated with  
4           the television program;

5           generating commands to suspend execution of the interactive application during each  
6           commercial broadcast during the television show; and

7           generating commands to resume execution of the interactive application when the  
8           television program is broadcast after each commercial.

1 25. A computer program product for controlling execution of interactive applications for  
2 broadcast programs, comprising:

3 a plurality of channel interfaces, each channel interface coupled to receive control  
4 signals for a specific channel from a scheduling system that schedules the  
5 broadcast of broadcast programs on each of a plurality of channels, each  
6 channel interface further including a translator and an event manager;

7 the translator for a channel interface coupled to receive the control signals related to  
8 broadcast programs on the specific channel, and translate the control signals  
9 into commands to the event manager, which commands depend on the state of  
10 broadcast programs broadcast on the specific channel; and

11 the event manager for a channel interface coupled to receive the commands from the  
12 translator and generate commands to a server to control the execution of  
13 interactive applications associated with broadcast programs on the specific  
14 channel.

1 26. The computer program product of claim 25, wherein:

2 the translator for a channel interface maintains a separate state machine for each  
3 uniquely identified broadcast program which has an interactive application;  
4 and

5 the event manager for a channel interface maintains a separate state machine for each  
6 interactive application of broadcast programs on the specific channel.

1 27. A system for controlling execution of interactive applications for broadcast  
2 programs, the system comprising:

3 an automation server for communicatively coupling with a source of control signals  
4 that control the operation of broadcast sources, the broadcast sources  
5 providing the broadcast programs, the automation server determining from the  
6 control signals for a broadcast program a state of the broadcast program and  
7 an interactive application associated with the broadcast program, and

8           generating commands responsive to the state of the broadcast program to  
9           control execution of the interactive application on a broadcast receiver and  
10          display of the interactive application on the display device in synchrony with  
11          display of the broadcast program on the display device; and  
12          a broadcast server that receives the commands from the automation server and  
13          provides the interactive applications and signals for controlling execution of  
14          the interactive application for broadcast to the broadcast receivers.

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